

## Two Spacecraft Interferometric Doppler Tracking\*

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Spacecraft Doppler tracking is the only on-going experimental effort to search for gravitational waves in the milliHertz frequency band. These single-spacecraft observations, however, suffer from noise sources that can be, at best, partially reduced or calibrated by implementing specialized and expensive hardware. The fundamental limitation is imposed by the frequency fluctuation inherent in the clocks referencing the microwave system.

A new experimental technique, in which interferometry is implemented with two spacecraft Doppler tracked by the same ground antenna, is presented. We show that proper post-processing combination of the data sets allows the complete removal of frequency noise due to the troposphere, ionosphere, the frequency standard, and **all** mechanical and microwave equipment at the ground station affecting the radio link. Expected sensitivity figures for bursts, continuous and stochastic gravitational wave signals are discussed.<sup>1</sup>

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